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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,639	11/18/2003	Takashi Takizawa	Q77768	3272
23373	7590	07/01/2005	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			JENKINS, JERMAINE L	
			ART UNIT	PAPER NUMBER
			2855	

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/714,639

Applicant(s)

TAKIZAWA ET AL.

Examiner

Jermaine Jenkins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) 31-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 and 35-59 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11182003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 12, 18-24, 28-30 & 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikeda et al (6,441,451).

In regards to claims 1, 27 & 35, Ikeda et al teaches the semiconductor pressure sensor comprising a substrate having a first surface and a second surface opposite to the first surface, a diaphragm formed in the substrate and arranged to be displaceable by a pressure medium acting on the first surface of the substrate; and a sensor arranged on the second surface of the substrate to detect displacement of the diaphragm (Column 2, lines 48-62; See Figures 1a-1f).

With respect to claims 2-5, 12 & 28-30, Ikeda et al teaches a support (i.e., diaphragm support member) arranged adjacent to the second surface of the substrate (Column 3, lines 5-7) wherein a portion of a first surface of the surface of the support is joined to the second surface of the substrate and another portion of the first surface opposed to the sensor is offset from the sensor in a direction orthogonal to the first surface (Column 8, lines 59-67; See Figure 1f).

With respect to claim 6, Ikeda et al teaches the support includes a through-hole (190) interconnection for outputting a signal from the sensor (Column 6, lines 45-54; See Figure 1f).

With respect to claim 18, Ikeda et al teaches insulation layer (120) arranged between the substrate and the support (Column 5, lines 34-44).

With respect to claims 19-23, Ikeda et al teaches a sealing metal (i.e. chrome or aluminum) arranged between the substrate and the support (Column 10, line 64 – Column 11, line 6).

With respect to claim 24, Ikeda et al teaches the substrate comprises a silicon chip (i.e. silicon material) (Column 5, lines 34-43).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7-11, 13-17 & 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (6,441,451) in view of Mora et al (5,894,144).

With respect to claims 7, 10, 11, 13 & 16-17, Ikeda et al teaches the claimed invention except for a through-hole extending from the first surface of the substrate to the second surface of the substrate; a conductive material filled in the through-hole; and a conductive connector arranged on the first surface of the substrate and connected to the conductive material.

Mora et al teaches a semiconductor having a through-hole (11) extending from the first surface of the substrate to the second surface of the substrate; a conductive material (i.e. conductive epoxy resin) filled in the through-hole (11); and a conductive connector (20, i.e.

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projection) arranged on the first surface of the substrate and connected to the conductive material (Column 20, lines 19-33; Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a conductive material within the through hole as taught by Mora et al in the semiconductor of Ikeda et al for the purpose of improving the reliability of the electrical connection.

With respect to claims 8 & 14, Mora et al teaches the conductive connector (20) comprises a bump (Column 20, lines 19-33; See Figure 1).

With respect to claims 9 & 15, Mora et al teaches the conductive connector (20) comprises a pad (i.e. external pad) (Column 20, lines 19-33; See Figure 1).

With respect to claim 52, Mora et al teaches forming a metal pad and a sealing metal (10, i.e. bonding pad) on the second surface of the silicon substrate (Column 3, lines 9-19; See Figure 1).

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (6,441,451) in view of Kurtz et al (6,595,066).

With respect to claim 26, Ikeda et al teaches the claimed invention except for the sensor comprises a piezo-resistive element. Kurtz et al teaches a semiconductor device having the piezoresistive elements (14) (Column 3, lines 10-19; See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a sensor having piezo-resistive element as taught by Kurtz et al in the semiconductor of Ikeda et al for the purpose of enabling the sensor to receive a force or pressure from any direction (Kurtz et al; Column 2, lines 20-45).

6. Claims 36-39, 53, 54 & 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (6,441,451) in view of Kurtz et al (6,272,929).

With respect to claims 36, 37, 53 & 54, Ikeda et al teaches the claimed invention except for forming a glass support having a first and second surface, forming a recess in the first surface of the glass, and joining the glass support to the silicon so that the recess is arranged adjacent to the piezo-resistive element to form a space therebetween.

Kurtz et al teaches a semiconductor pressure sensor forming a glass support (45) having a first and second surface, forming a recess in the first surface of the glass, and joining the glass support (45) to the silicon so that the recess is arranged adjacent to the piezo-resistive element to form a space therebetween (Column 2, lines 10-37; See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a glass support as taught by Kurtz et al in the semiconductor pressure sensor of Ikeda et al for the purpose of accessing various contact areas of the silicon structure associated with various sensors (Column 2, lines 24-27; See Figure 1; Kurtz et al).

With respect to claims 38 & 39, Kurtz et al teaches the step of forming the diaphragm in the silicon substrate is performed before the step of joining the glass support to the silicon substrate (Column 3, lines 50-61; See Figures 1 & 7).

With respect to claim 59, Ikeda et al teaches the sensor is arranged between the diaphragm and recess (Column 2, lines 48-62; See Figures 1a-1f).

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7. Claims 40-51 & 55-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (6,441,451) and Kurtz et al (6,272,929) as applied to claims 36-39 above, and further in view of Mora et al (5,894,144).

With respect to claims 40, 41, 44, 45, 48, 49 & 51, Ikeda et al and Kurtz et al teach the claimed invention except for a through-hole extending from the first surface of the substrate to the second surface of the substrate; a conductive material filled in the through-hole; and a conductive connector arranged on the first surface of the substrate and connected to the conductive material.

Mora et al teaches a semiconductor having a through-hole (11) extending from the first surface of the substrate to the second surface of the substrate; a conductive material (i.e. conductive epoxy resin) filled in the through-hole (11); and a conductive connector (20, i.e. projection) arranged on the first surface of the substrate and connected to the conductive material (Column 20, lines 19-33; Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a conductive material within the through hole as taught by Mora et al in the semiconductor of Ikeda et al for the purpose of improving the reliability of the electrical connection.

With respect to claims 42 & 46, Mora et al teaches the conductive connector (20) comprises a bump (Column 20, lines 19-33; See Figure 1).

With respect to claims 43 & 47, Mora et al teaches the conductive connector (20) comprises a pad (i.e. external pad) (Column 20, lines 19-33; See Figure 1).

With respect to claim 50, Kurtz et al teaches the sensor is a piezo-resistive element (10) beneath the insulation film (Column 2, lines 15-21).

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With respect to claims 55-58, Ikeda et al teaches a sealing metal (i.e. chrome or aluminum) arranged between the substrate and the support (Column 10, line 64 – Column 11, line 6).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermaine Jenkins whose telephone number is 571-272-2179. The examiner can normally be reached on Monday-Friday 8am-430pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jermaine Jenkins
A.U. 2855



William Oen
Primary Examiner